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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/745,998	12/26/2000	Masayuki Hata	001699	1371

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WILLE, DOUGLAS A

ART UNIT	PAPER NUMBER
	2814

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

	Application No.	Applicant(s)
	09/745,998	HATA, MASAYUKI
Examiner	Art Unit	
Douglas A Wille	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

1) Responsive to communication(s) filed on 19 May 2003.

2a) This action is FINAL.                  2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

4) Claim(s) 1-38 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-38 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6) <input type="checkbox"/> Other: _____ .

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13 – 19 and 32 – 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 13 and 32 show acceptor and/or donor levels that are nonuniformly formed in the quantum well structure. Claims 14 and 33 show acceptor levels as being more on one side. It is not understood how one can form energy levels in a quantum well that are on one side. There is no analytical description of the energy levels of a quantum well that permit the energy levels on one side to be different than on the other side and the mathematical description of a quantum well can only provide levels that represent the well as a whole. The description in the claims shows a situation that is not physically possible. Could this possibly be a reference to nonuniform doping? If so, it must so state. Similar problems occur with respect to claims 15 – 19 and 33 – 38.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 5, 9, 12, 20, 24, 28 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Landwehr et al.

6. With respect to claim 20, Landwehr et al. show (see Figure 2 and column 5, line 22 et seq.) a light emitting device with a first p-layer 6, a first n-layer 10, a light emitting layer 5, a second p-layer 4 between the emitter and n-layer where the piezoelectric effect is inherent in the structure with the InGaAs well and InGaAlAs surrounding layers. Note that the well layer has a smaller bandgap than the barrier layers.

7. With respect to claim 1, Landwehr et al. show that the types can be reversed (column 6, line 11).

8. With respect to claims 12 and 31, the limitation is inherent in the structure.

9. With respect to claims 5 and 24, the material has a zincblende structure and with respect to claims 9 and 28 the material is III-V.

### *Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landwehr et al. in view of Hashimoto.

12. With respect to claims 2 and 21, Landwehr et al. show (see Figure 2 and column 5, line 22 et seq.) a light emitting device with a first p-layer 6, a first n-layer 10, a light emitting layer 5, a second p-layer 4 between the emitter and n-layer where the piezoelectric effect is inherent in the structure with the InGaAs well and InGaAlAs surrounding layers. Landwehr et al. show only InGaAlAs layer and InGaAs layers and do not show if the clad layers are of different composition. Hashimoto shows a laser (see cover Figure and column 3, line 55 et seq.) in which the clad layers 16, 20 serve both to confine the light and the carriers and provides the benefits shown (column 1, line 35 – column 2, line 20). It would have been obvious to adjust the bandgap of the clads to meet the Hashimoto requirements for the benefits shown.

13. Claims 3, 4, 6, 7, 8, 10, 11, 22, 23, 25, 26, 27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landwehr et al.

14. Landwerh et al. show that the structure provides for high data rate transmission (column 2, line 5) and it would be obvious to apply this structure to other material systems such as Wurtzites, nitrides and II-VI materials as a design alternative. The strain is inherent in the materials with the given structure. With respect to claims 4, 6, 23 and 25 the crystal directions are inherent in the materials.

15. Claims 13 - 19 and 32 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Landwehr et al. in view of Otsuka et al.

16. With respect to claims 13 – 18 and 32 – 37, Landwehr et al. do not show whether the doping density is uniform or not but Otsuka et al. show that the use of graded doping (column 1,

line 58) will improve the laser performance. It would have been obvious to use the graded doping shown by Otsuka et al. in the Landwehr et al. device to increase its performance.

17. With respect to claims 19 and 38, it would have been obvious to make the number of donors equal to the number of acceptors to provide charge neutrality.

***Response to Arguments***

18. Applicant's arguments with respect to the 112 rejection are not understood and states that other than nonuniform doping one could use vacancy donor/acceptor levels. This is not doping? It is reiterated that the description of nonuniformly formed acceptor/donor levels is physically meaningless. It is noted that for a given donor level, for instance, the donor level is determined by the crystal host and the donor specie and it is not known how such a level can be made nonuniform. Moreover, the quoted section of the specification does not address the issue raised and is of no import.

19. The remainder of Applicant's remarks are addressed to whether or not Landwehr et al. structure inherently shows piezoelectric effects. It is Examiner's contention that such effects will occur in the Landwehr et al. structure. Note that Applicant's specification only describes relative values of the appropriate coefficient (see, for instance, page 2, line 25) and there is no showing that the effect is zero for other orientations

***Conclusion***

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Douglas A. Wille  
Primary Examiner

July 14, 2003